IN THE CLAIMS

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A rotary engine for use with compressible fluids, the engine comprising:

a first rotation element mounted to rotate about a first axis;

a casing having a surface enclosing at least a part of the first rotation element, an elongate cavity of varying cross sectional area being defined between a surface of the first rotation element and the casing surface; and

a plurality of second rotation elements mounted to rotate about respective different second axes, each second rotation element being mounted to project through a slot in the casing surface and to cooperate with the first rotation element surface so as to divide the cavity into adjacent working portions,

wherein each second rotation element comprises a plurality of projecting portions having respective different radii about the second axis, the different radii causing the projecting portions to project into the cavity by respective different amounts, so that the volumes of the working portions vary as the first and second rotation elements rotate,

wherein, in use, fluids in a working portion undergo compression, combustion and expansion as a closed volume, the closed volume being defined during the compression, combustion and expansion by an adjacent pair of second rotation elements.

2. (Original) The engine of claim 1, wherein each projecting portion of a second rotation element spans an angle about the respective second axis, the radius of the projecting portion constantly varying about the axis.

3. (Original) The engine of claim 1, wherein each projecting portion of a second rotation element spans an angle about the respective second axis, the radius of the projecting portion stepping about the axis.

4. (Original) The engine of claim 3, wherein a number of the projecting portions of each second rotation element only partially project through a respective slot at any time during rotation of the first and second rotation elements.

5. (Original) The engine of claim 4, wherein a maximum angle spanned by a slot about a respective second axis is smaller that the angle spanned by a number of the projecting portions of each second rotation element.

6. (Original) The engine of any one of the preceding claims, wherein the first rotation element surface is a cylindrical surface.

7. (Original) The engine of claim 6, wherein the first rotation element is internal to the casing surface and the second rotation elements are external to the casing surface.

8. (Original) The engine of claim 6, wherein the first rotation element is external to the casing surface and the plurality of second rotation elements are internal to the casing surface.

9. (Previously presented) The engine of claim 1, wherein the first rotation surface is an end surface.

10. (Previously presented) The engine of claim 1, further comprising ignition means for ignition of a compressed fluid prior to expansion.

11. (Currently amended) The engine of claim 1, wherein the first rotation element further comprises at least one passage for fluid inlet ~~and/or fluid outlet~~.

12. (Currently amended) The engine of claim 1, wherein the casing further comprises a number of valves~~, each valve being operative as a fluid inlet or fluid outlet only when adjacent to a working portion of the cavity, and wherein each valve is only adjacent to a working portion of the cavity during a fraction of a cycle of the device~~.

13. (Previously presented) The engine of claim 12, wherein, in use, each valve is never adjacent to a lowest volume working portion of the cavity during a cycle of the engine, thereby avoiding contact between valves and highest pressure fluids.

14. (Currently amended) The engine of claim 12 or 13, wherein each of the at least one valves is operative to vary the flow rate of a fluid into a working portion of the cavity~~, to vary the pressure of fluid within a working portion of the cavity, or to vary a compression and/or expansion ratio of the engine~~.

15. (Previously presented) The engine of any one of claims 12 to 13, wherein closed loop feedback control is used to control the operation of each of the at least one valves, the closed loop feedback control being based on at least one engine operating parameter.

16. (Previously presented) The engine of claim 15, wherein the at least one engine operating parameter comprises at least one of fluid inlet pressure, fluid outlet pressure and rotary speed.

17. (Previously presented) The engine of claim 1, wherein the second rotation elements are distributed about the first rotation element, each second rotation element being mounted to rotate about a respective second axis that is perpendicular to the first axis.

18. (Previously presented) The engine of claim 1, wherein the first rotation element surface and the casing surface further define a seal between working portions of the cavity.

19. (Cancelled)

20. (Previously presented) The engine of claim 1, wherein, in use, fluids in a working portion undergo the compression, combustion and expansion within one rotation of the first rotation element.